

# Technical Memorandum

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**TO:** Bucklin Place LLC  
**FROM:** Dylan Frazer, LG; Tim Syverson, LHG  
**DATE:** September 23, 2016  
**RE:** **Sub-Slab Soil Vapor and Indoor Air Sampling Results**  
**Happy Nails Tenant Space – Bucklin Place**  
**Silverdale, Washington**  
**Project No. 1595001.020.025**

## Introduction

As a follow up to the ongoing investigations at the adjacent Ultra Custom Cleaners (UCC) tenant space, sub-slab soil vapor samples and one indoor air sample were collected from the Happy Nails tenant space on August 22 and August 24, 2016, respectively. The analytical results for the indoor air (Table 1) and sub-slab soil vapor samples (Table 2) are attached. For comparison with the detected concentrations, the attached tables include screening levels developed for both the indoor air and sub-slab soil vapor samples using Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method B methodologies for a commercial worker scenario, and published US Environmental Protection Agency (EPA) Indoor Air Action Levels (IAAL) for a 10-hour/day exposure. The MTCA screening levels, developed using the Modified Method B procedures as allowable under MTCA and suggested by Ecology vapor intrusion guidance, assume that an adult worker will occupy the Happy Nails tenant space for 60 hours per week (12 hours/day, 5 days/week) for 52 weeks per year.

In the indoor air sample (IA-1), trichloroethene (TCE) was detected at a concentration greater than the Modified MTCA Method B screening level of 1.7 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The detection of TCE is also greater than the published EPA IAAL-Accelerated Response Action Level of 7  $\mu\text{g}/\text{m}^3$ . Tetrachloroethene (PCE) was also detected at a concentration greater than the laboratory reporting limit, but less than the modified MTCA Method B screening level of 27  $\mu\text{g}/\text{m}^3$ . Vinyl chloride and cis-1,2-dichloroethene were not detected at concentrations greater than the laboratory reporting limits.

In the sub-slab soil vapor samples (SV-1, SV-2, and SV-3), both TCE and PCE were detected at concentrations greater than the laboratory reporting limits. The detection of PCE at sample location SV-3 was also greater than the Modified MTCA Method B screening level of 900  $\mu\text{g}/\text{m}^3$ . The remaining detections of TCE and of PCE in the soil vapor samples are less than the Modified MTCA Method B soil vapor screening levels.

If you have any questions or comments regarding the soil vapor or indoor air sampling results, please contact the undersigned.

LANDAU ASSOCIATES, INC.



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### **Attachments**

Table 1: Sub-Slab Soil Vapor Analytical Results

Table 2: Indoor Air Analytical Results

**Table 1**  
**Sub-Slab Soil Vapor Analytical Results**  
**Happy Nails Tenant Space - Bucklin Place**  
**Silverdale, Washington**

Analyte	Modified MTCA Method B Sub-Slab Soil Vapor Screening Level- Commercial Exposure Scenario <sup>a</sup>	Sample Location, Lab ID, Sample Date		
		Happy Nails		
		SV-1 P1604169-001 8/22/2016	SV-2 P1604169-002 8/22/2016	SV-3 P1604169-003 8/22/2016
<b>Volatiles (µg/m<sup>3</sup>)</b> <b>Method EPA TO-15 SIM</b>				
Vinyl Chloride	NC	1.6 U	1.3 U	9.1 U
cis-1,2-Dichloroethene	NC	1.6 U	1.3 U	9.1 U
Trichloroethene	57	<b>16</b>	<b>8.2</b>	<b>19</b>
Tetrachloroethene	900	<b>290 J</b>	<b>140 J</b>	<b>1,100 J</b>
Helium (EPA 3C Modified; ppmV)	NA	<b>30,000</b>	<b>3,700</b>	<b>5,000</b>

U = The compound was not detected at the reported concentration.

J = Analyte was positively identified. Reported result is an estimate below the associated reporting limit but above the method detection limit.

NC = Not calculated as analyte was not detected.

NA = Not applicable.

Bold = Detected compound.

  = Exceedance of screening criteria.

EPA = US Environmental Protection Agency

µg/m<sup>3</sup> = Micrograms per cubic meter

MTCA = Model Toxics Control Act

<sup>a</sup> MTCA Method B Sub-Slab Soil Vapor Screening Level adjusted for a commercial exposure scenario (adult only, 60 hour/week, 52 week/year) and a vapor attenuation factor (VAF) of 0.03.

**Table 2**  
**Indoor Air Analytical Results**  
**Happy Nails Tenant Space - Bucklin Place**  
**Silverdale, Washington**

Analyte	Modified MTCA Method B Indoor Air Screening Level- Commercial Exposure Scenario <sup>a</sup>	EPA Indoor Air Action Level- Accelerated Response Action Level Commercial/ Industrial 10-hour work day	EPA Indoor Air Action Level- Urgent Response Action Level Commercial/ Industrial 10-hour work day	Sample Location, Lab ID, Sample Date
				Happy Nails
				IA-1 P1604179-001 8/24/2016
<b>Volatiles (µg/m<sup>3</sup>)</b> <b>Method EPA TO-15</b>				
Vinyl Chloride	NC	NA	NA	6.5 U
cis-1,2-Dichloroethene	NC	NA	NA	6.5 U
Trichloroethene	1.7	7	21	<b>9.8</b>
Tetrachloroethene	27	NA	NA	<b>6.0 J</b>

U = The compound was not detected at the reported concentration.

J = Analyte was positively identified. Reported result is an estimate below the associated reporting limit but above the method detection limit.

NC = Not calculated as analyte was not detected.

NA = Not applicable.

Bold = Detected compound.

  = Exceedance of screening criteria.

EPA = US Environmental Protection Agency

µg/m<sup>3</sup> = Micrograms per cubic meter

MTCA = Model Toxics Control Act

<sup>a</sup> MTCA Method B Indoor Air Screening Level adjusted for a commercial exposure scenario (adult only, 60 hour/week, 52 week/year).